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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/673,669      | 09/30/2003  | Dave Stumbo          | 2132.0080001        | 2029             |

26111 7590 04/19/2005

STERNE, KESSLER, GOLDSTEIN & FOX PLLC  
1100 NEW YORK AVENUE, N.W.  
WASHINGTON, DC 20005

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| EXAMINER |
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LIANG, REGINA

|          |              |
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| ART UNIT | PAPER NUMBER |
|----------|--------------|

2674

DATE MAILED: 04/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |                        |                     |  |
|------------------------------|------------------------|---------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b> | <b>Applicant(s)</b> |  |
|                              | 10/673,669             | STUMBO ET AL.       |  |
|                              | <b>Examiner</b>        | <b>Art Unit</b>     |  |
|                              | Regina Liang           | 2674                |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-53 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-53 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 9/30/03 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>6/03/04</u> . | 6) <input type="checkbox"/> Other: ____.  |

## **DETAILED ACTION**

### ***Drawings***

1. Figures 1 and 2 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-53 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's admitted prior art (Figs. 1, 2 and sections [0003]-[0008], hereinafter the admitted prior art) in view of Koyama et al (US. PUB. NO. 2002/0024489 hereinafter Koyama) and Lieber et al (WO 02/48701 hereinafter Lieber).

As to claim 1, Figs. 1 and 2 of the admitted prior art discloses an active matrix backplane used within a display, comprising a plurality of pixels, a plurality of pixel transistors. The admitted prior art does not disclose each pixel transistor is a nanowire transistor. However, it is

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old and well known in the art that an active matrix display having a plurality of pixels and using field-effect transistors (for instance, thin-film transistors) as the switching elements, for example see Koyama [0039]. It is also old and well known in the art that a field-effect transistor comprising a nanowire transistor, for example see Lieber Fig. 16a, page 3, lines 3-5, page 30, line 21 to page 31, line 20. Thus, in view of the teachings of Koyama and Lieber, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the pixel transistor of the admitted prior art to be a field-effect transistor comprising nanowire transistor as taught by Lieber since the nanowire forming the channel region is made very small such that the space requirement on a chip area is reduced.

As to claim 2, Fig. 16a of Lieber shows the nanowire transistor comprising nanowires extending at least between a source and a drain electrode.

As to claims 4, 7, 27, 32, 52, Fig. 2 of the admitted prior art teaches the matrix backplane comprising a plurality of column transistors and a plurality of row transistors. Lieber teaches the transistor comprising a nanowire transistor. Thus it would have been further obvious to one of ordinary skill in the art at the time the invention was made to modify the column transistors and the row transistors of admitted prior art to be nanowire transistors as claimed since the nanowire forming the channel region is made very small such that the space requirement on a chip area is further reduced.

As to claims 5, 8, 53, Fig. 16a of Lieber shows the nanowire transistor comprising nanowires extending at least between a source and a drain electrode.

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As to claims 10-13, 28-31, to further use nanowire technology to make the related components as claimed would have been further obvious to one of ordinary skill in the art since it would further reduce the size of the overall device on a chip area.

As to claims 14-26, the admitted prior art teaches the display is LCD, OLED, etc as claimed ([0003]).

As to claims 33-36, see section [0009] of the admitted prior art.

As to claims 3, 6, 9, 37-49, the admitted prior art as modified by Koyama and Lieber discloses the claimed invention except for the arrangement, location, value and material of the nanowires transistors. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the admitted prior art as modified by Koyama and Lieber to have the nanowires transistors as claimed, since it has been held that discovering an optimum value, range, location, material of a result effective variable involves only routine skill in the art.

As to claims 50, 51, Fig. 16a of Lieber teaches a transistor having a row electrode (52), a gate electrode (58), and a pixel electrode (56).

### ***Conclusion***

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.


Roesner et al (US. PUB. NO. 2003/0132461) teaches a field effect transistor comprising nanowire.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Regina Liang whose telephone number is (571) 272-7693. The examiner can normally be reached on Monday-Friday from 8AM to 5:00PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Edouard, can be reached on (571) 272-7603. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Regina Liang  
Primary Examiner  
Art Unit 2674

4/14/05